

## REMARKS

Applicants appreciate the thorough examination of the present application as evidenced by the Final Action mailed August 24, 2009. Claims 1, 8, 10, 11, 13 and 15 are pending in this application. Responsive to the Final Action, Applicants respectfully request further consideration of this application in view of the remarks below. The issues raised by the Examiner are addressed hereinbelow.

### **Claim Rejections - 35 U.S.C. § 103**

Claims 1, 8, 10, 11, 13 and 15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Takahashi et al. (2000) *J. Mater. Sci.* **10**:2346–2348 (hereinafter, “Takahashi et al.”) in view of Sasaki et al. (1999) *J. Mater. Sci. Lett.* **18**:1193–1195 (hereinafter, “Sasaki et al.”). The Examiner maintains the assertion that it would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the Fe/S flux ratio in the process of Takahashi et al. as suggested by Sasaki et al. to form a pure pyrite film at lower temperatures, such as in the claimed range. Applicants respectfully disagree.

The requirements for the establishment of a *prima facie* case for obviousness have been set forth in a previously filed paper. The Examiner notes that the disclosures of Sasaki et al. discuss that a pyrite film free of marcasite and pyrrhotite may be prepared by a low pressure MOCVD process, and that both a high partial pressure of sulfur and high temperature are critical to the preparation of pure pyrite (*see* Sasaki et al., p. 1193, col. 1, last paragraph). Sasaki et al. further discuss, and as noted by the Examiner, that “[a pyrite film] can be produced by setting the Fe/S flux ratio at greater than 6.8 with a deposition temperature of more than [300 °C].” (*see* Sasaki et al. p. 1194, col. 2, lines 4–6). Although Sasaki et al. discuss the possibility of forming a pure pyrite film at a temperature that may read on the claimed range, the pyrite film of Sasaki et al., in addition to being prepared at low pressure, is prepared from iron and sulfur powder (*see* Sasaki et al., p. 1193, col. 2, first paragraph).

In the Office Action of March 6, 2009, the Examiner acknowledges that there would have been no motivation to combine the disclosures of the abstract of Schleich and Chang (1991) *J.*

*Cryst. Growth* **112**:737–744 (hereinafter, “Schleich and Chang”) with the disclosures of Takahashi et al. at the time the present invention was made, “since [Schleich and Chang] teaches a low pressure CVD method utilizing different reactants than the atmospheric pressure CVD method of [Takahashi et al.] and provides no suggestion that the temperature ranges utilized in their low pressure process would be suitable for any other deposition process, such as atmospheric pressure CVD.” (*see* page 2, item 2 of the Office Action of March 6, 2009).

The disclosures of Sasaki et al. discuss a low pressure CVD method utilizing different reactants than the atmospheric pressure CVD method of Takahashi et al. (iron and sulfur powder vs. a metal (iron) halide and a thioamide). Furthermore, the disclosures of Sasaki et al. provide no suggestion that the conditions required for forming a pure pyrite film, i.e., an Fe/S flux ratio at greater than 6.8 with a deposition temperature of more than 300 °C, using low pressure CVD, would be suitable for any other deposition process, such as atmospheric pressure CVD. In that Sasaki et al. do not disclose a method for forming a pyrite film using atmospheric pressure CVD as instantly claimed and do not disclose a method for forming a pyrite film using the reactants as instantly claimed, Applicants respectfully submit that the disclosures of Takahashi et al. and Sasaki et al., either alone or in combination, do not disclose all the elements of the instantly claimed method. Moreover, Applicants respectfully submit that the disclosures of Sasaki et al. provide no motivation to combine the temperature ranges discussed by Sasaki et al. with the method of Takahashi et al. for the same reasons as acknowledged by the Examiner regarding the disclosures of Schleich and Chang in the Office Action of March 6, 2009, since Sasaki et al. discuss a low pressure CVD method utilizing different reactants than the atmospheric pressure CVD method of Takahashi et al. and provides no suggestion that the temperature ranges utilized their low pressure process would be suitable for other deposition processes, such as atmospheric pressure CVD.

In view of the foregoing, Applicants respectfully assert that the instant claims are patentable over Takahashi et al. in view of Sasaki et al., and respectfully request that the instant rejection be withdrawn.

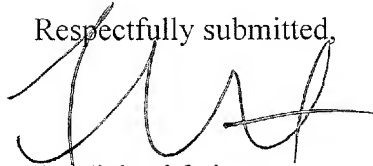
Attorney Docket No. 5576-177  
In re: Takahashi et al.  
Application No.: 10/525,443  
Filed: February 24, 2005

### CONCLUSION

Accordingly, Applicants submit that the present application is in condition for allowance and the same is earnestly solicited. Should the Examiner have any small matters outstanding of resolution, she is encouraged to telephone the undersigned at 919-854-1400 for expeditious handling.

No fee is believed due with the filing of this paper. This amount is believed to be correct. However, the Commissioner is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-0220.

Respectfully submitted,

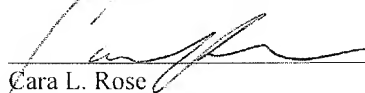


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I hereby certify that this correspondence is being transmitted via the Office electronic filing system in accordance with § 1.6(a)(4) to the U.S. Patent and Trademark Office on October 20, 2009.

  
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